NEW! C50 On Site Multifunction Portable Calibrator

Wahl C50 Calibrator

- **Far Superior Accuracy as Compared to Fluke!**
- **Simultaneous Measurement and Generation**
- **Quick Connect Terminals**

Wide backlit Screen
Protected by a Polycarbonate Membrane

Designed in close collaboration with industrial users, the Wahl C50 integrates all the necessary functions for calibration and maintenance of processes.

Its ergonomic design and embedded software make the C50 an easy to use high performance calibrator.

IP 54 rated and fully protected by an anti-shock boot, with integrated quick connect terminals and a high-contrast backlit display, it is comfortable to use in all conditions.

Its elastomer keypad protects it from dirt and grease marks, and the raised keys allow the C50 to be used with gloves. It has 10 user programmable configurations for repetitive jobs.

Display: Backlit display with contrast settings

USB Connection/Rechargeable NiMH Batteries

Recommended Ambient Conditions: 0° to 50 °C, 10 to 80% Relative Humidity

Maximum Ambient Conditions: -10° to 55 °C, 10 to 80% Relative Humidity

Protection Rating: IP54

Weight/Dimensions: 7 oz (200g); 8.3 x 4.3 x 2.0 inches (210 x 110 x 50mm)

TRACEABLE TO NIST

1 WARRANTY

FEATURES

The Wahl C50 is a portable calibrator able to measure and generate simultaneously on 2 isolated channels.

It has a wide high-contrast backlit display for use in low ambient light conditions.

Fully protected by the anti-shock boot, a lexan window and polycarbonate membrane keypad are resistant to dirt. The raised numerical keys are usable even when using protective gloves.

The C50 is able to measure and generate voltage, current, and resistance signals, temperature by resistive probes and thermocouples, and frequency for frequency signals and dry contacts.

Specifications subject to change without notice

C50 Functions and Performances

FUNCTIONS and PERFORMANCES

QUICK CONNECT SYSTEM:

This unique system is used by pressing down on the top of the terminal, inserting bare wires up to 3mm in diameter or compensated thermocouple connectors, and then releasing.

Additionally, standard 4mm Banana Plugs or Safety Plugs can be inserted on the front panel.

Thermocouple wires and connectors are held tight between 2 brass plates which provide excellent cold junction compensation.

DISPLAY RESOLUTION:

Wahl C50 comes with user selectable resolution for those users who prefer less resolution, or want to simplify non-critical measurements.

FUNCTIONS:

The C50 allows the following physical values to be measured and simulated:

- **Voltage**
- **Current**
- **Resistance**
- **Temperature by resistive probes and thermocouples**
- **Frequency for frequency signals and for dry contacts**

It is able to perform scaling of process signals and temperature probe correction. It is compatible with HART transmitters by inserting a 250 ohms resistance, without disturbing digital data transfer.

DISPLAY:

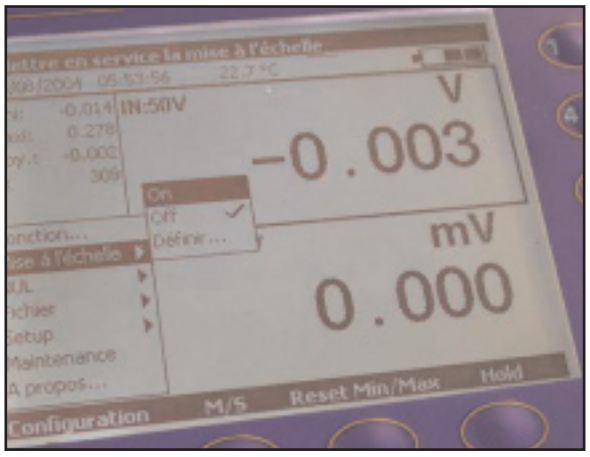
Wahl C50's dual display simultaneously indicates the measurement value, the emitted value, the gauge, and the used functions.

On the top line the date, time and external temperature are also indicated.

During measuring, Average, Maximum, Minimum and the number of measurements are displayed on the left.

During emission this part of screen displays all details of ramps, steps and constant value emission functions.

Drop-down menus are used with the navigator, and on-line help is available to make connections of probes and wires easier.



TRACEABLE TO NIST

ONE YEAR 1 WARRANTY

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PALMER Wahl INSTRUMENTATION GROUP

170 Years of Continued Innovation

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C50 Functions and Performances

Wahl C50 Calibrator

Functions and performances: @23°C ±5°C

DC Current: Measurement

The C50 is able to measure up to 50mA, with or without power supply of loop (24V power supply).

Range	Resolution	Accuracy / 1yr	Remarks
±50mA	1µA	0.018%R + 2µA	Rin < 25 Ω

For measurements of transmitters outputs, special ranges give a dual display using mA and % of full scale.
C50 also provides linear or quadratic signals.

In current measurement Hart compatibility can be selected to measure currents coming from Hart protocol transmitters.

DC Current: Emission

Range	Resolution	Accuracy / 1yr
24mA	1µA	0.018%R + 2µA

Emission with or without loop supply (24V).

Preprogrammed Steps

	0%	25%	50%	75%	100%
4-20mA linear	4	8	12	16	20
0-20mA linear	0	5	10	15	20
4-20mA quad	4	5	8	13	20
0-20mA quad	0	1.25	5	11.25	20
4-20mA values	3.8 - 4 - 4.2		12	19 - 20 - 21	

DC Voltage: Measurement

Range	Resolution	Accuracy / 1yr	Remarks
±100mV	1µV	0.013%R + 3µV	Rin > 10 M Ω
±1V	10µV	0.013%R + 20µV	Rin > 10 M Ω
±10V	100µV	0.015%R + 200µV	Rin = 1M Ω
±50V	1mV	0.015%R + 2mV	Rin = 1M Ω

Rin: input resistance

DC Voltage: Emission

Range	Resolution	Accuracy / 1yr	Remarks
100 mV	1µVΩ	0.013% R+ 2µV	Load 1K Ω
2V	10µVΩ	0.013% R+ 20µV	Load 2K Ω
20V	100µV	0.015% R+ 200µV	Load 4K Ω

Frequency and Counting: Measurement

Range	Resolution	Accuracy / 1yr
20kHz	< 0.01Hz	0.005%R

Threshold triggering: 1V.
Unit scale: pulse/min or Hz.
Measurement on frequency signal and on dry contacts.
Measurement for counting will be done on defined time or on infinite time.

Frequency and Pulses: Emission

Range	Resolution	Accuracy / 1yr
1000Hz	< 0.01Hz	0.005% R
10kHz	10Hz	0.005% R

Unit scale: pulse/min or Hz.
Pulse emissions.
Dry contact simulation.
Max amplitude: 20V selectable by user.

Resistance Measurement:

Range	Resolution	Accuracy / 1yr	Remarks
400 Ω	1 m Ω	0.012% R+ 10 m Ω	Measurement current = 0.25mA
4000 Ω	10 m Ω	0.012% R+ 100 m Ω	

2, 3 or 4 wires resistance measurement: automatic recognition of number of connected wires, indicated on screen.

Resistance: Emission

Range	Resolution	Accuracy / 1yr	Remarks
400 Ω	10 m Ω	0.014% R + 30 m Ω	I ext from 0.1 to 10mA
4000 Ω	100 m ΩΩ	0.014% R + 300 m Ω	I ext from 0.01 to 0.1mA

Resistance emission: establishing time < 1ms for compatibility with smart transmitters type.

C50 Temperature Specifications

RESISTIVE PROBES: MEASUREMENT & EMISSION					
Probe Type	**Range**	**Resolution Measurement**	**Accuracy/1Yr Measurement**	**Resolution Emission**	**Accuracy/1 Yr Emission**
Pt 50 (α = 3850)	-220°C + 1200°C	0.01°C	0.012% L + 0.06°C	0.03°C	0.014% L + 0.18°C
Pt 100 (α = 3850)	-220°C + 1200°C	0.01°C	0.012% L + 0.05°C	0.02°C	0.014% L + 0.12°C
JPt 100 (α = 3916)	-200°C + 510°C	0.01°C	0.012% L + 0.05°C	0.02°C	0.014% L + 0.12°C
Pt 100 (α = 3926)	-210°C + 850°C	0.01°C	0.012% L + 0.05°C	0.02°C	0.014% L + 0.12°C
Pt 200 (α = 3851)	-220°C + 600°C	0.01°C	0.012% L + 0.12°C	0.10°C	0.014% L + 0.33°C
Pt 500 (α = 3850)	-220°C + 1200°C	0.01°C	0.012% L + 0.07°C	0.03°C	0.014% L + 0.18°C
Pt 1000 (α = 3851)	-220°C + 1200°C	0.01°C	0.012% L + 0.05°C	0.02°C	0.014% L + 0.08°C
Ni 100 (α = 618)	-60°C + 180°C	0.01°C	0.012% L + 0.03°C	0.01°C	0.014% L + 0.08°C
Ni 120 (α = 672)	-40°C + 205°C	0.01°C	0.012% L + 0.03°C	0.01°C	0.014% L + 0.08°C
Ni 1000 (α = 618)	-60°C + 180°C	0.01°C	0.012% L + 0.03°C	0.01°C	0.014% L + 0.08°C
Cu 50 (α = 427)	-70°C + 150°C	0.1°C	0.012% L + 0.18°C	0.01°C	0.014% L + 0.10°C
Cu 50 (α = 428)	-50°C + 150°C	0.01°C	0.012% L + 0.06°C	0.03°C	0.014% L + 0.15°C

Resistive probes measurements in 2, 3 or 4 wires: automatic recognition of number of connected wires, with indication on screen
- Temperature coefficient: < 10% of accuracy /°C.
- The accuracy in table above is given for a sensor connection in 4 wires
- Above specifications are for the C50 meter only, and do not include specific sensor or implementation error.
- Measurement current: 0.01mA to 1mA
- Establishing time: <1ms for simulation (simulation on quick transmitters)

THERMOCOUPLES: MEASUREMENT				THERMOCOUPLES: EMISSION		
Sensor	**Range**	**Resolution**	**Accuracy/1Yr**	**OUT Range**	**Resolution**	**Accuracy/1Yr**
K	-250°C to -200°C -200°C to -120°C 120 °C to -0°C +0°C to 1372°C	0.2°C 0.1°C 0.05°C 0.05°C	0.80°C 0.25°C 0.10°C 0.013% R + 0.08°C	-240°C to -50°C -50°C to -0°C +0°C to 1372°C	0.2°C 0.1°C 0.05°C	0.60°C 0.10°C 0.013% R + 0.08°C
T	-250°C to -200°C -200°C to -120°C -120°C to -50°C -50°C to +400°C	0.2°C 0.05°C 0.05°C 0.05°C	0.70°C 0.25°C 0.10°C 0.013% R + 0.08°C	-240°C to -100°C -100°C to -0°C +0°C to +400°C	0.2°C 0.05°C 0.05°C	0.40°C 0.10°C 0.013% R + 0.08°C
J	-210°C to -120°C -120°C to -0°C +0°C to +1200°C	0.05°C 0.05°C 0.05°C	0.25°C 0.09°C 0.013% R + 0.07°C	-210°C to -0°C +0°C to +1200°C	0.05°C 0.05°C	0.20°C 0.013% R + 0.07°C
E	-250°C to -200°C -200°C to -100°C -100°C to -0°C +0°C to +1000°C	0.1°C 0.05°C 0.05°C 0.05°C	0.45°C 0.15°C 0.07°C 0.013% R + 0.05°C	-240°C to -100°C -100°C to +40°C +40°C to +1000°C	0.10°C 0.10°C 0.05°C	0.25°C 0.10°C 0.013% R + 0.05°C
R	-50°C to +150°C +150°C to +550°C +550°C to +1768°C	0.5°C 0.2°C 0.1°C	0.80°C 0.013% R + 0.35°C 0.013% R + 0.2°C	-50°C to +350°C +350°C to +900°C +900°C to +1768°C	0.5°C 0.2°C 0.1°C	0.5°C 0.013% R + 0.35°C 0.013% R + 0.20°C
S	-50°C to +150°C +150°C to +550°C +550°C to +1768°C	0.5°C 0.2°C 0.1°C	0.80°C 0.013% R + 0.35°C 0.013% R + 0.25°C	-50°C to +120°C +120°C to +450°C +450°C to +1768°C	0.5°C 0.2°C 0.1°C	0.8°C 0.013% R + 0.35°C 0.013% R + 0.25°C
B	+400°C + 900°C +900°C + 1820°C	0.2°C 0.1°C	0.013% R + 0.4°C 0.013% R + 0.2°C	+400°C + 850°C +850°C + 1820°C	0.2°C 0.1°C	0.013% R + 0.4°C 0.013% R + 0.2°C
U	-200°C to 660°C	0.05°C	0.15°C	-200°C to 600°C	0.05°C	0.15°C
L	-200°C to 900°C	0.05°C	0.2°C	-200°C to 900°C	0.05°C	0.2°C
C	-20°C + 900°C +900°C + 2310°C	0.1°C 0.1°C	0.25°C 0.013% R + 0.15°C	-20°C + 900°C +900°C + 2310°C	0.1°C 0.1°C	0.25°C 0.013% R + 0.15°C
N	-240°C to -190°C -190°C to -110°C -110°C to -0°C +0°C to 1300°C	0.2°C 0.1°C 0.05°C 0.05°C	0.5°C 0.15°C 0.08°C 0.013% R + 0.06°C	-240°C to -190°C -190°C to -110°C -110°C to -0°C +0°C to 1300°C	0.2°C 0.1°C 0.05°C 0.05°C	0.3°C 0.15°C 0.08°C 0.013% R + 0.06°C
Platinum	-100°C to +1400°C	0.05°C	0.3°C	-100°C to +1400°C	0.05°C	0.3°C
Mo	0°C to +1375°C	0.05°C	0.013% R + 0.06°C	0°C to +1375°C	0.05°C	0.013% R + 0.06°C
NiMo/NiCo	-50°C to +1410°C	0.05°C	0.013% R + 0.30°C	-50°C to +1410°C	0.05°C	0.013% R + 0.30°C

Accuracy is warranted for reference junction (RJ) at 0°C
With use of internal RJ (except couple B) add an additional uncertainty of 0.3°C
CJC localization is selected by keypad programming, except for thermocouple B:
- External at 0°C, internal (temperature compensation of instrument's terminals) or by temperature programming
- Temperature coefficient: < 10% of accuracy /°C. Display unit: °C and °F

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C50 Additional Functions

Wahl C50 Calibrator

ADDITIONAL FUNCTIONS

FILE MENU: User can save up to 10 full configurations of the instruments and recall them as desired.

Configurations can be saved and recalled in function of user and of use. Configurations include all programming done on instrument, as the range.

CONTRAST ADJUSTMENT: Screen's contrast can be adjusted as desired to fit with measurement environment.

SCREEN BACKLIGHTING: Time of backlighting can be programmed to save battery.

BATTERY LIFE: C50 Battery Life is 5 - 10 hours depending on which Function is selected.

SCALING: In measurement and simulation, scaling allows process signals to be displayed in % of FS or in all other units.

This function also allows sensors to be corrected after a calibration.

RELATIVE MEASUREMENT:

• Programming of a reference value different from the one of the instrument (NUL function).

• Subtracting of constant value by measuring or programming it from a measured value (TARE function).

SQUARE ROOT: In current measurement and simulation, this function takes into account a quadratic signal coming from transmitter of type ΔP.

STATISTICAL FUNCTIONS: Average, Minimum, Maximum and also number of measurements done are always displayed.

Reset key allows values to be updated.

SIMULATION MENU: Simulation value is set by entering value on keypad or by changing the appropriate digit with the cursor.

RAMPS GENERATION: Starting, ending and length time values of simple or cyclic ramps can be set to do simulation.

Number of ramps can also be adjusted in case of cyclic ramps for any signals.

STEPS SIMULATION:

• Program mode: Starting value, number of steps and the duration of step.

• Manual mode: User has approximately one hundred preset values.

In current simulation, user will have some additional preset values in function of range and according to 0%, 25%, 50%, 75% and 100% from selected gauge. Choice is done between gauges:

• 0-20mA: linear or quadratic

• 4-20mA: linear or quadratic

SYNTHESIZER: With 100 values manually set, the C50 allows curve generation to be remade. 100 user settable values allow complex curves to be generated.

TRANSMITTER FUNCTION: C50 is able to be used as a transmitter.

Measurement input is copied on the output with scaling.

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INCLUDED: C50 is supplied standard with 6 testing leads with crocodile clips, a quick battery charging system, neck strap, and stand for desktop use, User Manual on CD Rom, attache style professional carrying case, and NIST Calibration Certificate.

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